



# Fact Sheet



UNITED STATES AIR FORCE

377TH AIR BASE WING (AFMC)  
Office of Public Affairs, Kirtland Air Force Base, NM 87117

505-846-5991

## DOD Starbase<sup>®</sup> Flight

Through the Air Force Research Laboratory La Luz Academy's Department of Defense Starbase<sup>®</sup> Flight for sixth graders, students develop basic skills and discover they can aspire to careers in math, science, engineering and technology.

The La Luz Academy is on Kirtland Air Force Base, New Mexico.

During the school year, students come to the AFRL La Luz Academy for five nonconsecutive days of instruction.

The curriculum focuses on model rocketry; flight simulation, including the forces of flight, Bernoulli's Principle and aircraft control surfaces and components; Newton's Laws of Motion; technical software; properties and states of matter; properties of air; goal setting; development, innovation and use of technology; space exploration; teamwork and avoiding substance abuse. The curriculum also incorporates Air Force Core Values: Integrity First, Service Before Self and Excellence in All We Do.

Students learn about Newton's Laws of Motion, such as the Law of Inertia (an object at rest tends to stay at rest and an object in motion tends to stay in motion) and experience it with hands-on activities such as designing and building a Mars lander, a craft designed to protect a rover landing on Mars.

The sixth graders build a six-foot model rocket and use modeling and simulation software to predict the trajectory of a rocket based on its specifications and weather conditions. Then, the students participate in launching the model rockets they built. Each student is assigned a specific



duty such as assembly and inspection team, data manager, range safety officer, launch control officer, tracking team and recovery team, as part of the launch activity. After each rocket is launched, students compare their predicted trajectory data to the actual trajectory data collected during the launch.

They learn about the basic properties and states of matter, the properties of air, the nature and content of our atmosphere and the effects of air pressure on our bodies. Students apply these concepts to hands-on educational activities that include: a cryo-

cooler demonstration, where an AFRL scientist shows them how a cryocooler works and then flash-freezes objects, such as marshmallows and flowers, using liquid nitrogen; balloon balance, which shows that air has mass and can crush, where an empty soda can is crushed by the air pressure outside it.



In addition, the students learn about the four forces of flight (gravity, lift, thrust and drag) and airplane control surfaces (wings, ailerons, rudders, etc.) and Bernoulli's Principle (faster-moving air creates lower pressure), then practice what they've learned on computers equipped with flight simulator software and hardware. Pilots from the Air Force and private industry act as advisors during the flight simulation portion of the day.

For more information, contact AFRL La Luz Academy at (505) 846-8042 or go to: <http://www.vs.afrl.af.mil/TechOutreach/TT/K-12.aspx>

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